F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

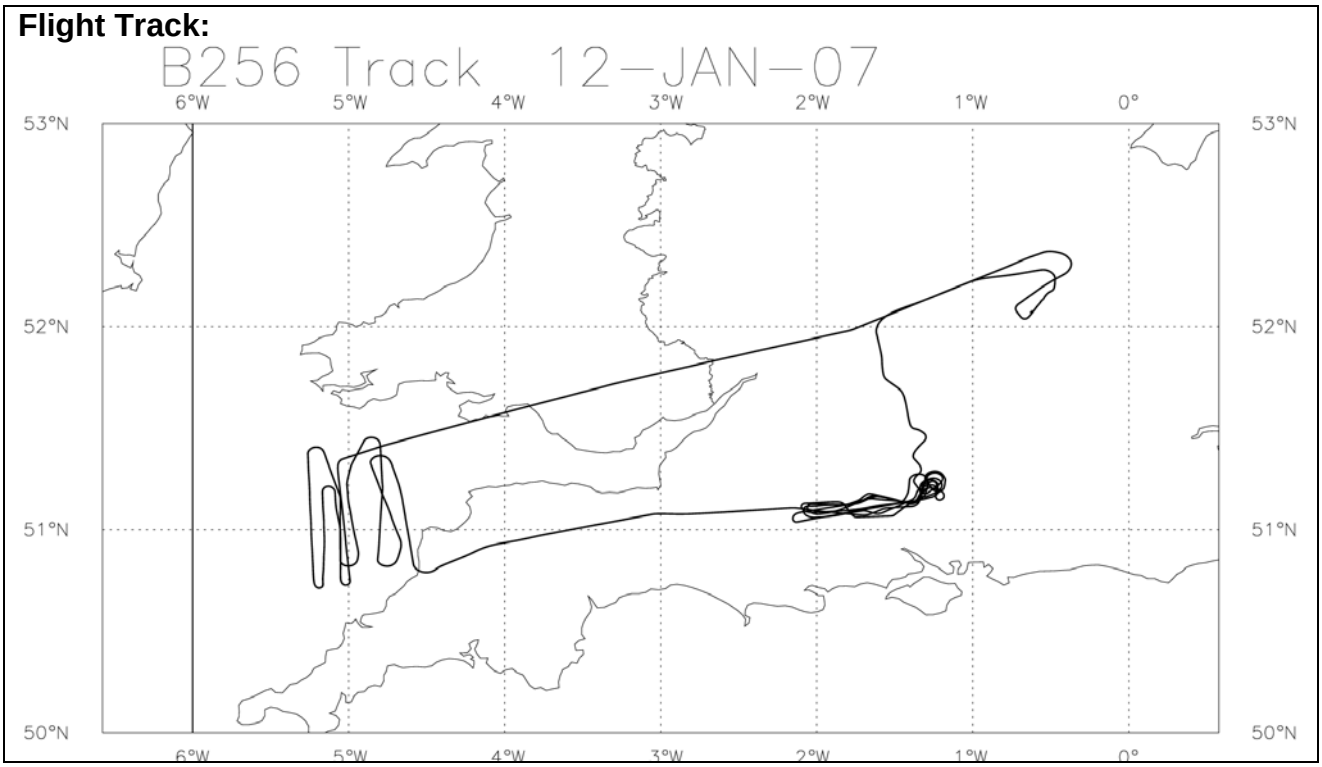
Flight No.:	B256
Date:	12 January 2007
Take Off	10:06:54
Landing:	15:20:39
Flight Time	5h13m45

Campaign: WINTEX – AIRS/AQUA overpass, instrument test

Operating Area: SW Approaches

POB	Position	Name	Institute
1	Captain	Alan Foster	Directflight
2	Co-pilot	Ian Ramsay-Rae	Directflight
3	CCM	Dawn Quinn	Directflight
4	Mission Scientist 2	Chawn Harlow	Met Office
5	Flight Manager	Ruth Purvis	FAAM
6	Flight Manager (Training)	Jamie Trembath	FAAM
7	*Core Chemistry*	*unattended*	*FAAM*
8	Cloud Physics	Martyn Pickering	Met Office
9	Mission Scientist 1	Simon Osborne	Met Office
10	MARSS / DEIMOS 1	Dave Pollard	Met Office
11	MARSS / DEIMOS 1	Jeff Brown	Met Office
12	Guest	Andrew Mirza	Met Office (Aviation Outcomes)
13	Guest	Ben Devonsih	Met Office (Boundary Layer Dynamics)
14			
15			
16			
17			
18			
19			
20			

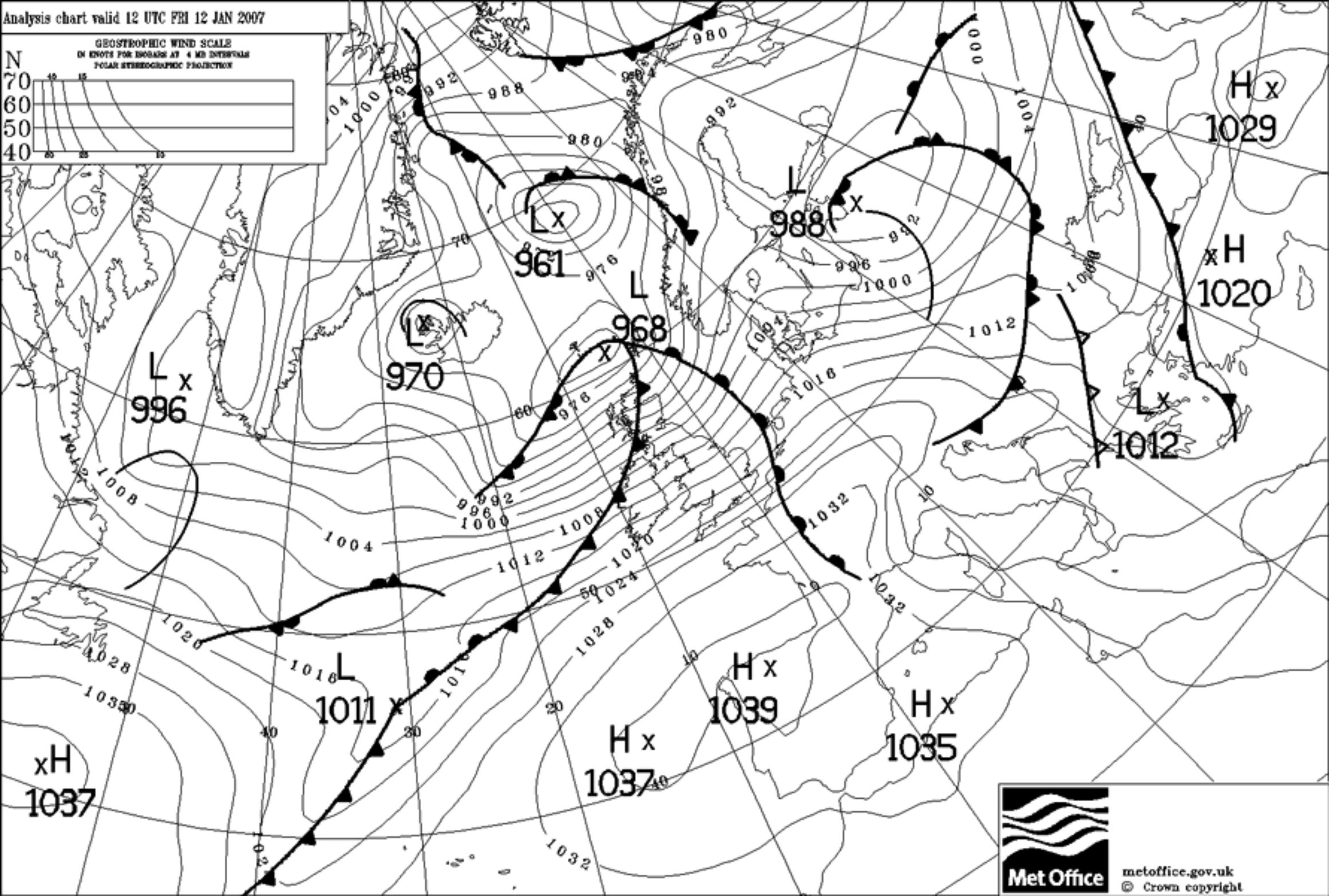
Flight Track:



FLIGHT SUMMARY

Flight No b256
Date: 12 Jan 2007
Project: Wintex
Location: SW approaches and Chilbolton

Start Time	End Time	Event	Height (s)	Hdg	Comments
095405		Start-Up	0.21 kft	126	off hangar APU
095432		Video	0.21 kft	126	start
100257		taxy	0.22 kft	176	
100654		T/O	0.21 kft	213	
101232		ASP	8.0 kft	042	
110133		Sonde 1	14.0 kft	254	
110733	111047	Profile 1.1	7.0 - 4.0 kft	187	
111227	111728	Profile 1.2	4.0 - -.21 kft	345	
112103	112732	Run 1	-.15 - -.18 kft	186	100ft
112732	112909	Profile 2	0.00 - 1.8 kft	189	
112811		Video	0.61 kft	193	DFC2 UFC2
113055	114054	Run 2	1.3 kft	344	1600ft qnh 1024
114221	115229	Run 3	0.76 - 0.73 kft	167	1000ft
115415	120408	Run 4	2.2 kft	357	2500ft
120537	121548	Run 5	2.7 kft	189	3000ft qnh 1024
121738	122603	Run 6	4.0 kft	011	4000ft
123116		Sonde 2	14.0 kft	185	
124737	124920	Profile 3.1	7.0 - 5.5 kft	072	to FL30
125826	130110	Profile 3.1	5.5 - 3.5 kft	097	
130110	130154	Run 7	3.5 kft	086	
131552	132603	Run 8	2.7 kft	255	qnh 1020
131728		event	2.7 kft	281	chilbolton
132759	133323	Run 9	2.7 kft	088	
133320		event	2.7 kft	055	Chilbolton
134457	135505	Run 10	3.2 kft	241	3000ft qnh 1006 (3400 ft on qnh) south of chibolton
134531		event	3.2 kft	238	chilbolton overpass
135655	140142	Run 11	3.2 kft	086	chilbolton
140143	140148	event	3.2 kft	042	chilbolton
140717	141743	Run 12	3.7 kft	263	3500ft q1006
141944	142554	Run 13	2.2 kft	078	2000ft
142552		event	2.2 kft	113	chilbolton
143356	144215	Run 14	1.7 kft	245	1500ft
143504		event	1.7 kft	265	chilbolton 400m south
144626	145013	Run 15	2.7 kft	061	
145735		DEIMOS	5.0 kft	285	on
151016		DEIMOS	10.0 kft	057	off
151215		ASP	8.3 kft	078	closed
152039		Land	0.26 kft	215	
152538		Shutdown	0.28 kft	308	52'04.36N 0'37.50W


Analysis chart valid 12 UTC FRI 12 JAN 2007
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L x 961
L x 988
L 968
L x 970
L x 996
L x 1012
H x 1029
x H 1020
L 1011
H x 1039
H x 1037
H x 1035
x H 1037
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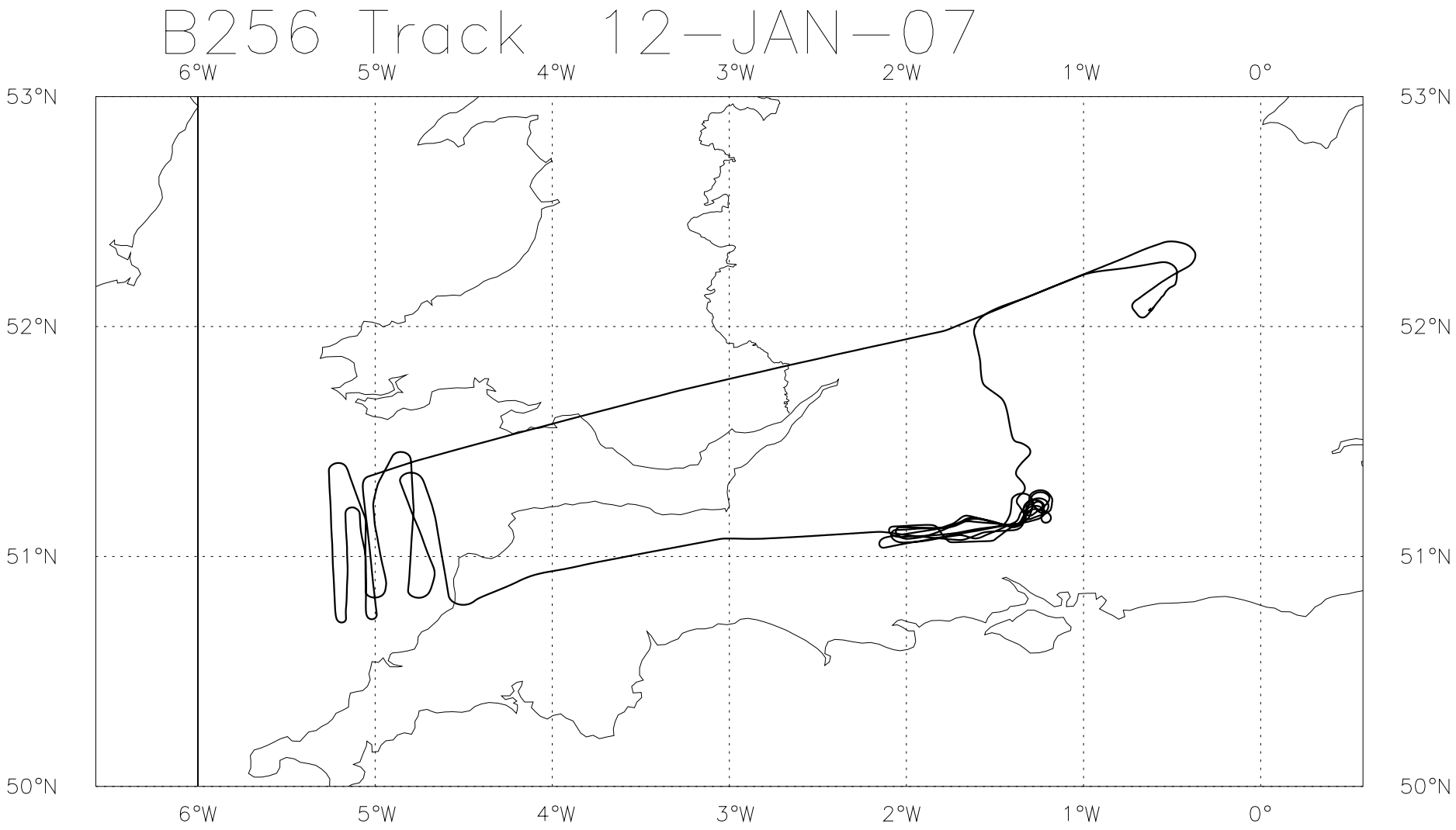
B256 Track 12-JAN-07
6°W
5°W
4°W
3°W
2°W
1°W
0°
53°N
52°N
51°N
50°N

WINTEX Sortie Brief: Stratocumulus measurements

Date : 12-Jan-2007 **Flight Number : B256**
Mission Scientist : C.Harlow/S.Osborne

Sortie Aims: The principal aim of this sortie is to obtain measurements of the vertical and horizontal structure together with microphysical properties of stratocumulus cloud in the vicinity of the Chilbolton radar site and over sea areas around the SW peninsula. The measurements will be used to verify remotely-sensed values of a number of parameters (cloud base and top, cloud LWC and LWP, drizzle LWC and drop size spectrum, turbulence within and below the cloud layer) that are obtained using combinations of radar and lidar measurements. The measurements may also be combined with observations from Cardington and other sites to describe the evolution of a Sc layer over land.

Sortie Location: In the vicinity of the Chilbolton observatory, Hampshire and sea areas around the SW peninsula.

Communications: Chilbolton radar ("RADSEARCH") on 130.575 MHz.

Weather conditions: A layer of stratocumulus that extends over the Chilbolton site. An absence of medium / upper cloud is preferred but not essential. Wind direction between about 225 and 280 degrees true.

Instrument requirements:
- JW / Nevzorov to be zeroed when in clear air at any altitude when straight / level.
- Cloud physics console. Normal operation of all probes
- CDP – operating. Ensure its PC has correct time setting before takeoff.
- Turbulence probe – monitor performance when in icing conditions. When any sensor is seen to be not responding, descend below freezing level to deice.

Sortie detail:
(a) T+0 Take-off Cranfield, transit to a position off the S.Coast (Lyme Bay) at FL100 or above to drop one sonde (40 min)
(b) T+40 Reposition to the Chilbolton area to fly an inbound leg on the alongwind radial. Obtain information on cloud base and top altitudes from Radsearch. If cloud top is 500ft or more *above* the safety altitude (2300ft amsl) then in-cloud runs over Chilbolton are possible (10 min).
(c) T+60 straight / level leg of 5 min oriented along a radial within ~10 deg of mean wind direction towards radar and finishing overhead the site. Procedure turn to reverse heading. Repeat the 5 min straight / level leg, commencing run start prior to passing outbound over the radar site. Procedure turn. (18 min)
(d) Flight patterns at (c) to be flown at altitudes: Cloudbase – 500ft, Cloudbase + 500ft, mid-cloud-layer, Cloudtop – 300ft. Altitudes also selected on advice from Radsearch (Minimum time 80min)
(e) T+140 If cloud conditions permit continued operations in Chilbolton area, then items c) and d) may be repeated.
(f) Alternatively, transit at FL100 to sea area upwind (ideally Lyme Bay but otherwise, to the SW of Lands End or in Bristol Channel). Drop one sonde. (15min)

(g) T+155 Commence stack of straight / level legs of 10 min duration, orientation acrosswind preferred. Minimum number of altitudes to be flown:
500ft asl, Cloudbase – 500ft, Cloudbase +500ft, mid-cloud-level, Cloudtop – 500ft, Cloudtop + 1000ft. Others may be flown at Mission Scientist discretion. (70min min)
(h) T+225 Sawtooth profile acrosswind. Max.altitude Cloudtop + 500ft, min altitude Cloudbase – 1000ft. Ascent / descent rate 1000ft/min. Straight/level duration 1 min between climbs/descents. Aim to complete 2 full cycles of climb/descent. (20min)
(j) T+245 Repeat items (f) and (g) as time permits.
(k) T+275 Return transit
(l) T+315 Land

Figure 1. The location of microwave radiometer measurements to measure Liquid Water Path at Weybourne, RAF Marham, Cardington (Bedford). The radar/lidar site at Chilbolton is also shown.

B256 Mission Scientist De-brief Sheet **12th January 2007**

Weather conditions

Large warm sector covering most of England and Wales; strong westerly winds at low-levels. Widespread stratocumulus and high cirrus within the warm sector. Radar was showing no drizzle at the surface. Fairly stable conditions, with surface pressure around 1020 mb.

Summary of the flight

A very successful stratocumulus mission was conducted in conjunction with the Chilbolton cloud radar. Two operating regions were chosen prior to take-off: Bristol Channel (north of Cornwall/Devon), and over Chilbolton. The Bristol Channel was approximately upwind of, and was therefore was the 'source region' of the air advecting towards, Chilbolton. Two sondes were successfully deployed over the Bristol Channel from FL140, before and after working the stratocumulus in that region. A series of runs were performed roughly north-south across wind at the following levels (in order):

(i) 100ft, cloud base was very low and visibility was poorer at 250ft than 100ft ! PCASP reported concs of ~30/cc.
(ii) 1600ft above cloud base
(iii) 1000ft in cu(?) bases, which were of variable altitude but often below 500ft
(iv) 2500ft mid Sc cloud
(v) 3000ft near Sc tops
(vi) 4000ft above Sc

There was a Sc deck, with an ill-define cloud base caused by scud and cu with bases below that of the Sc, and rising into the Sc. The MBL was therefore 'messy'. Lots of drizzle was observed on the windscreen and 2D-C, presumably some of it reaching the surface. A climb to FL140 was then followed by a transit towards Chilbolton. A short profile descent was made through the cloud before starting runs on approximate radials of ~260 deg magnetic. A good layer of Sc was over Chilbolton with high cirrus above. We reached Chilbolton in time for the ~1310 z Cloudsat overpass. The advice from RADSEARCH (comms with Chilbolton) was two layers of cloud: (1) 350-700m, (2) 1200-1500m. Radar scans were performed roughly in line with our radials. We found the Sc layer to lie above a layer of cu that was sometimes interacting with the Sc (similar to over the sea). Selecting radials at our desired levels was difficult due to heavy air traffic in the area. But good runs were performed on inbound and outbound radials from the observatory at the following levels (in order):

(i) 3500ft R7 INBOUND- very short due to ATC
(ii) 2500ft R8+R9 in cu(?) OUTBOUND and INBOUND
(iii) 3000ft R10+R11 OUTBOUND and INBOUND, in Sc
(iv) 3500ft R12, OUTBOUND, in Sc
(v) 2000ft R13 INBOUND, in cu
(vi) 1500ft R14 OUTBOUND, just skimming cu bases
(vii) 2500ft R15 INBOUND, in cu?

Pockets of drizzle were observed at all levels in cloud. ATC often caused a change in heading from the desired radial.

Instrumentation

(1) DEIMOS- when this is switched on, there is obvious electrical interference on the PCASP and FFSSP. When switched off, the PCASP and FFSSP are fine. This is likely to be a cabling problem. Probable solution- new cables need to be manufactured.
(2) Nephelometer- strange scattering coefficients, 700nm scatter > 550nm scatter > 450nm scatter throughout the flight (whether in clean MBL or high level). This is not a simple zeroing issue.
(3) FFSSP- occasional dropout.
(4) CDP was switched on; quality of data unknown.

Mission Scientist's Log

S. ROSBOROUGH

Flight No **B**256 Date 12/01/07 Page 1 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
100654					T/o CRANFIELD.
					Scu – multiple layers? Bases ~2600ft
					tops ~5000ft. (occasional breaks)
	→	FL140			TRANSIT. Good layer of Scu below
~104100	→	FL140			6/8 Ci above
					Problem with TWC? -ve values.
104110		FL140	254	51°18'N 4°54'W	29 m/s / 277° winds. GOOD!
110130		FL140			SONDE #1 gone.
					Conditions good - thin Ci 7/8 above
					8/8 Scu below!
~1103	NOT PROFILE	↓	~184°		descending to above cloud
110729	P1↓	FL070	187	50°54'N 4°54'W	27° dew point depression @ FL070 Start of profile descent thin cloud layer
					'wisps' tops to Scu - ice?! Flat tops →
		5500'			moister layer above cloud (thin) No Scu visible
		4500'			v. v. dry slot
111042	P1	4000'			Interrupt descent to turn just above tops.
111125	P1	4000'	345	50°42' 5°0'	Re-start descent. 1000ft/min.
		3500			Tops. T = +5°C. No ice!
					~~visibility~~ visibility → not too strong.
		1400'			can see sea surface.
		900'			Bases level? can even.
		↓			poor vis. weak lights.
111730		50'			End profile. V. shallow - V. moist in MBL.
					DZ on wind sonde.
114102	P1	1000'	186		Start SLF Constant.

Mission Scientist's Log

S.R. OSBORNE.

Flight No B256 Date 12/01/07 Page 2 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
112416					Small. Brief in cloud – sunshine
					30 kts winds @ 240°. SS(6-7)
					PCASP ~ 30/cc !! Low!!
					Pockets of daily showers. ROUGHLY across wind
112734	R1	100'	189		End Run due to poor vis.
en 112901	R2	2000'			Cannot do a 1000ft run in base due to MSA
					~~the~~ 1600 A Lowest alt in Cu
113054	R2	1600'	344	50°42' 5°12'	Start run in lower part of cloud.
113240					Out of cloud – patchy Cu below.
113430	R2	1600'	345		Back into cloud. FFSSP ~ 300/cc? (v. rough)
					TWC off.
114053	R2	1600'			End Run in lower cloud (Cu?)
114220	R3	1000'	170	51°18' N 56' W.	Start Run in lowest part of cloud.
					winds. 21 m/s @ 254°.
					Can see sea surface most of the time.
					Good run in cloud. Cloudy/
114815	R3	1000'			out of cloud. variable base → Cu vs. Sea
					heavy dz sometimes.
115227	R3	1000'	191	50°48' 5°0'	End Run. to climb to next level.
115414	R4	2500'	354	50°46' 4°56'	Start Run in cloud 'mid'.
					Can see sea surface at times – sc.
					50/l. 400/cm³ : 25-c. ~dz.
					LWC : (dev/5-w) = 0.24 g/m³.
					New. Q_F = 0.37 g/m³
120404	R4	2500'			End Run → lower tops at western end. must be stopping & starting

Mission Scientist's Log

Flight No **B**...256... Date ...12/01/07...

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					climbing to next level. → 3000 ft.
120536	R5	3000'	190	51°18' 4°42'	Start in → ETG out upland to stay
					shimming with cloud tops. Looks!!
					→ good run for Te measurements!!
121546	R5	3000'	197	50°48' 4°42'	End Run in tops. climbing to next level
121738	R6	6000'	005	50°48' 4°31'	Start Run above Sc.
					Pcasp ~30/cc. some asbelow cloud.
					topmainly ~500ft. & Ci above
122426	R6	6000'			higher tops at this end of Norm.
122642					thi v. tops at cloud → for less than 1 secon
122604	R6	6000'	329	51°18' 4°48'	End Run above cloud.
123115	—	FL168	185	51°0' N 4°36W	SONDE #2 dropped successfully
124736	P3.1	FL070	088	51°0' 2°54'	Start profile descent — Bow thruster.
124920	P3.1	2055	084		Interrupt profile descent (air TC)
		"ROD SEARCH" LAYERS:			(1000 - 2200ft) 350m — 700m. (1)
					1.2km — 1.5km (2)
					(3200' - 4500')
125816	P3.1	FL055	096	51°0' 1°42'	Re-start descent! (others left)
125955		6300'			tops! qc max 0.5 g/m³ Good!
130112		3500'			End profile descent (Tobeam
					+ Start run INBOUND. base course)
130156	R7	3500'			End Run! Busy ATC.
					descending to 2500ft.
131352	R8	2500'	257		Start Run INBOUND in upper cloud layer
131728					Dz on windshield.

Low cloud thickening now.
132603 R8 2500'. End Run.

Mission Scientist's Log

Flight No **B**.256..... Date 12/01/07..... Page 4 of 5.....

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
		2500'			→ base of upper Sc layer – good
132752	R9	2500'	088	51°01'N 1°56'W	Start SLR INBOUND
					⇒ can see Cu & gnd below sometimes.
					maybe dz less intense here cf. over sea
133026		2500'			Light turn due to ATC !!
133110		2500'	↱ back to 055		+ left turn back again.
133316					o/head CHILBOLTON.
133322		2500'	057		End run.
		~~2500'~~			Start run. OUTBOUND somedz
134055	R10	3000'	240	51°6'19'	~~Start~~
134538					Abeam Chilbolton now (+sunk).
			↘ 266		Good run in solid Sc.
135503	R10	3000'	265	51°6' 2°0'	End run in Sc.
135654	R11	3000'	089	51°0' 1°54'	Start run INBOUND.
140123	R11				left turn ATC. + end run (~1 miles out)
		↗ 3500'			+ climbing.
140713	R12	3500'	269	51°6' 1°1'	Start run. in tops. Can see thru occas gaps.
					GOOD RUN. OUTBOUND.
					q. patchy @ ~0.7g/m³ in tops.
141746	R12	3500'	259	51°0' 2°6'	End run in tops. + descending in turn
141944	R13	2000'	047	51°6' 2°0'	Start run. INBOUND
					lots of dz on windscreen.
					lower q. level ⇒ logical!!
142544	R13	2000'			End run + o/head Chilbolton.
					descend to 1500ft in turn.

Mission Scientist's Log

Flight No **B** 256 Date 12/01/07 Page 5 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
	turning	1550'			winds 023 m/s / 272°
143354	R14	1500'	268	51°6' 1°2W	Start Run OUTBOUND.
143500		1500'			Abeam Chilbolton Dome now shimmering base.
143640					fire to NW A (small)
143730					good dz here / abeam Portsmouth Bldgs
					Another good run.
144207	R14	1500'	268	51°6' 2°W	End Run in base. ascending.
144624	R15	2500'	057	51°6' 1°6W	Start Run INBOUND. cloud.
					winds · 025 m/s @ 268°.
144758			112		turning right to chilbolton.
145007	R15	2500'	110	51°6' 1°2W	End Run over Ch. Tolton
					& end of Science.

CLOUD PHYSICS LOG Flight B 256

Date: 12/01/07	Operator: MAP	DRS Time: +0	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 1 of 1

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
11:07:30	70	0.08	2	1	1												Start Profile 1 from FL070
11:08:30	30	0.09		2													FL060
11:09:52	5	0.12															FL050
11:10:40	25	0.09		2													FL040
11:13:33	80	0.33	23	1500	1000												FL030
11:14:36	100	0.28	48	2000	1500	40	200	30	200							1	FL020
11:15:55	40	0.14	85	2000	2000	40	300	3000	400							1	FL010
11:17:30	80	0.14	95	200	20	15	375	400	200							1	End of Profile 1 @ 50’
11:21:04																	Start Run 1 @ 250’
11:22:00	50	0.13	103	80	10	5	350	200	400							1	
11:24:00	50	0.14	104	80	10			15									
11:26:00	70	0.10		60	5												
11:27:34																	End of Run 1 & Start Profile 2 from 100’
11:28:31	200	0.18	130	1500	2000	15	100	100	200							12	
11:29:12																	End of Profile 2 @ 2000’
11:30:57																	Start Run 2 @ 1600’
11:31:00	80	0.23	245	1500	2000	50	400	300	400							1	
11:33:00	9	0.12	276	5	1												
11:35:00	70	0.12	295	2000	1000	120	325	5500	400							1	
11:37:00	45	0.21	401	1000	1000	45	350	3300	400							1	
11:39:00	65	0.28	449	1500	1000	85	450	2400	600							1	
11:40:55																	End of Run 2
11:42:22																	Start Run 3 @ 1000’
11:43:00	60	0.17	590	1000	1000	10	225	30	200							1	
11:45:00	60	0.18	658	2000	1000	75	350	2700	200							1	
11:47:00	50	0.16	719	1000	800	45	450	360	400							1	
11:49:00	35	0.12	744	100	10												
11:51:00	25	0.11	747	100	10	7	450	4000	600							1	
11:52:28																	End of Run 3
11:54:16																	Start Run 4 @ 2500’
11:55:00	15	0.13	839	1500	1000	135	200	800	400							1	
11:57:00	100	0.31	881	1500	1000	200	425	2600	400							1	
11:59:00	140	0.35	962	2000	800	1000	300	12000	200							1	
12:01:00	90	0.33	1013	1500	1000	20	225	400	200							12	
12:03:00	15	0.24	1069	2000	1000	25	25									12	
12:04:06																	End of Run 4
12:05:37																	Start Run 5 @ 3000’
12:06:00	15	0.08															
12:08:00	125	0.33	1188	2000	1000	22	100									12	
12:10:00	70	0.40	1225	1500	900	770	325	300	200							1	
12:12:00	130	0.39	1299	2000	1000	455	125	15	200							12	
12:14:00	3	0.35	1323	1000	600	500	150	8	200							12	
12:15:48																	End of Run 5
12:17:40																	Start Run 6 @ 4000’
12:18:00	20	0.11	1358	2													
12:20:00	35	0.10															

CLOUD PHYSICS LOG Flight B 256

Date: 12/01/07	Operator: MAP	DRS Time: +0	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 2 of 2

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
12:22:00	15	0.08	1358	1													
12:24:00	15	0.11		1													
12:26:00	25	0.11		1													
12:26:05																	End of Run 6
12:47:38	80	0.08	1359	1													Start Profile 3.1 from FL070
12:48:47	25	0.08		1													FL060
12:59:10	20	0.09		1													FL050
13:00:20	130	0.34	1388	2000	1000	600	300	4500	200							1	FL040
13:01:15																	End of Profile 3.1 & Start Run 7 @ FL035
13:01:54																	End of Run 7
13:15:53																	Start Run 8 @ 2500’
13:16:00	340	0.27	1729	2000	2000	10	275	550	1000							1	
13:18:00	30	0.15	1827	2000	2000	10	225	300	200							12	
13:20:00	15	0.10	1851	10	1												
13:22:00	15	0.10	1852	10	3												
13:24:00	65	0.34	1876	1000	1000	45	200	75	200							1	
13:26:03																	End of Run 8
13:27:59			Fail														Start Run 9 @ 2500’
13:30:00	100	0.34	28	2000	2000	60	450	7000	400								
13:32:00			Fail														
13:33:24																	End of Run 9
13:44:59																	Start Run 10 @ 3000’
13:45:00	200	0.39	204	1500	1000	380	225	600	200							12	
13:47:00	35	0.45	288	2000	2000	100	300	700	400							1	
13:49:00	70	0.36	384	3000	3000												
13:53:00	160	0.34	732	2000	2000	360	300	2300	400							1	Word problems
13:55:05																	End of Run 10
13:56:57																	Start Run 11 @ 3000’
13:57:00	160	0.34	957	3000	4000	110	225	350	200							1	
13:59:00	125	0.36	1096	3000	3000	180	300	140	200							1	
14:01:00	85	0.37	1254	3000	3800	100	300	200	400							1	
14:01:39																	End of Run 11
14:07:25																	Start Run 12 @ 3500’
14:08:00	100	0.41	1635	3000	1000	400	200	40	200							12	
14:10:00	100	0.41	1804	3000	3000	200	125	35	200							12	
14:12:00	300	0.38	1914	3000	3000	265	150	180	400							12	
14:14:00	150	0.42	2097	3000	3000	300	250	15	200							12	
14:16:00	100	0.44	2182	3000	1500	365	200	50	200							12	
14:17:50																	End of Run 12
14:19:46																	Start Run 13 @ 2000’
14:20:00	110	0.36	2390	1000	2000	50	375	1000	200								
14:22:00	75	0.28	2578	2000	1000	15	300	90								1	
14:24:00	90	0.33	2693	2000	1000	35	325	900	200							1	
14:25:50																	End of Run 13
14:33:58			Fail														Start Run 14 @ 2000’
14:36:00	60	0.09	22	100	5	20	350	1500	400							1	

CLOUD PHYSICS LOG Flight B 256

Date: 12/01/07	Operator: MAP	DRS Time: +0	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 3 of 3

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
14:38:00	70	0.09	26	100	100	20	550	3800	400							1	
14:40:00	45	0.22	122	1500	2000	50	550	1300	400							1	
14:42:11																	End of Run 14
14:46:25																	Start Run 15 @ 2500’
14:47:00	55	0.18	552	2000	2000	95	450	1100	400							1	
14:49:00	60	0.20	639	2000	3000	50	400	400	200								
14:50:10																	End of Run 15
	PCASP Flowrate = 1.1CC/sec FFSSP failed several times. (Program fails to recognise housekeeping data)																

Microwave Radiometers FLIGHT LOG	Date	12/01/07	Flight	B256	log pages	
Operator(s)	Jeff Brown		Campaign	WINTEX		
Departure	Cranfield		Arrival	Cranfield		

System start

MARSS

Visual pod inspection						X
Close 3 SSP circuit breakers						X
Close all MARSS circuit breakers						X
FERA on				at time	08:26:00	
Temperature controller initial temps	Ch16	22°C	Ch 17	23°C	Ch18	20°C
Temperature controller set points		54°C		58°C	-20	40°C
MARSS CPU on				at time	08:26:00	
Initial target temperatures	Hot	287.9		Cold	283.6	
Target heating						
*** CHECK SCAN HEAD CLEAR ***						
Scanning on (LMD box)				at time	08:27:33	
Scan indication		Monitor	›		Visual	

Deimos

Close all Deimos circuit breakers						X
Turn on Deimos CPU						X
*** CHECK SCAN HEAD CLEAR ***						X
Start Deimos Software				at time	08:24:00	
Initial target temperatures	Hot			Cold		
Target heating						
Scan indication		Monitor	›		Visual	
Weather	Cloud			Precip		
	Surface			Pressure		
	Other					

System functionality check

(after initial system warmup, approx 1 hour)

PC to DRS Time error		$t_{PC}=t_{DRS}$ +		at time		
Brightness temps 'sensible'						
Target temps	MARSS:	Hot	345.0	Cold	284.2	
	Deimos:	Hot	344.9	Cold	292.37	

Channel gains 'sensible'	Ch1 A (-)	Ch3 A (-)	Ch1 B (-)	Ch3 B (-)	
	40.44	41.56	37.7	41.12	
	Ch16 (40-44)	Ch17 (45-49)	Ch18 (40-44)	Ch19 (40-44)	Ch20 (44-48)
		33.9	37.3	36.7	41.7

Power changeover

Headset on before start		
Listen to engine start sequence	4, 3, 2, 1.	
LMD off (3 switches, bottom to top)		
Exit Deimos Software (x)		
POWER CHANGEOVER		
LMD on (3 switches, top to bottom)	then pushbutton	
Restart Deimos Software		
System running again		at time

Flight #	B	Date		Operator(s)		log page	2	of	2

Time	Run id	Alt/FL	*Remarks*	Sys
09:25:41			Deimos off whilst affecting Cloud Physics	
09:26:10			Marss Ch16 – no data	
10:06:54			Take Off	
11:01:33			Drop sonde 1 released	
11:07:35			Start of profile descent from 7000ft to 50ft	
11:10:49			Profile interrupted at 4000ft	
11:12:28			Profile descent re-start from 4000ft to 50ft	
11:17:28			End of profile descent	
11:21:05	**1**	**100**	Start of run 1 at 100ft	
11:27:34	**1**	**100**	End of run 1 at 100ft. Start of profile 2	
11:29:09			End of profile 2	
11:30:56	**2**	**1600**	Start of run 2 at 1600ft	
11:40:54	**2**	**1600**	End of run 2	
11:42:22	**3**	**1000**	Start of run 3	
11:52:29	**3**	**1000**	End of run 3	
11:54:16	**4**	**2500**	Start of run 4	
12:04:06	**4**	**2500**	End of run 4	
12:05:37	**5**	**3000**	Start of run 5	
12:15:48	**5**	**3000**	End of run 5	
12:17:40	**6**	**4000**	Start of run 6	
12:26:05	**6**	**4000**	End of run	
12:31:17			Drop sonde 2 released	
12:47:39	**3.1**		Start of saw tooth 3.1 descent	
12:49:20	**3.1**	**5500**	Inerrupt of saw tooth descent	
12:58:26	**3.1**		Re-start of saw tooth descent	
13:01:10	**7**	**3500**	End of saw tooth descent. Start of run 7 abeam Chilbolton	
13:01:56	**7**	**3500**	End of run	
13:07:50		**3500**	Start of profile descent	
13:08:56		**2500**	End of profile descent	
13:15:52	**8**	**2500**	Start of run in passing over Chilbolton 13:17:28	
13:26:03	**8**	**2500**	End of run	
13:27:54	**9**	**2500**	Start of run - over Chilbolton at 13:33:20	
13:33:27	**9**	**2500**	End of run	
13:44:58	**10**	**3000**	Start of run – nearest to Chilbolton at 13:45:29	
13:55:10	**10**	**3000**	End of run	
13:56:57	**11**	**3000**	Start of run	
14:01:43	**11**	**3000**	End of run 1 mile short of Chilbolton	
14:07:14	**12**	**3500**	Start of run	
14:17:44	**12**	**3500**	End of run	
14:19:46	**13**	**2000**	Start of run over Chilbolton at 14:25:50	
14:25:50	**13**	**2000**	End of run	
14:34:00	**14**	**2000**	Start of run South of Chilbolton at14:35:34	
14:42:13	**14**	**2000**	End of run	
14:46:25	**15**	**2500**	Start of run	
14:50:13	**15**	**2500**	End of run over Chilbolton	
14:59:50			Marss time is plus 9secnds at this stage	
14:55:00			Deimos fired up (28V breaker made) at FM's request	

Flight: B256

KEY

- Not Fitted
- Fitted, Not Operated
- Duff Data
- Minor Problems
- OK

Thermometers
- Cabin Temperature:
- Heimann:
- Deiced Temp:
- Non-deiced Temp:

Hygrometers
- FWVS:
- General Eastern:
- Johnson Williams:
- Nevzorov:
- Total Water Probe:

Cameras
- Downward Facing:
- Forward Facing:
- Rearward Facing:
- Upward Facing:

Navigation + Aircraft
- Cruciform GPS:
- GIN Applanix:
- INU Honeywell:
- Radar Altimeter:
- RVSM IAS:
- RVSM Static Pressure:
- XR5 GPS:

Misc Core
- AMTG:
- AVAPS:
- Cabin Pressure:
- Fax machine:
- Printer:
- S9 Static Pressure:
- Satcom C:
- Satcom H:
- Turbulence Check Press:
- Turbulence Diff Press:
- Weather Radar:

DLUs:
- DLU AERACK:
- DLU BBR Lower:
- DLU BBR Upper:
- DLU Core Chem:
- DLU Core Consoles:
- DLU Port Aft:
- DLU Port Fwd:
- DLU Stbd Fwd:

Radiometers
Lower:
- BBR (clear) Lower:
- BBR (IR) Lower:
- BBR (red) Lower:

Upper:
- BBR (clear) Upper:
- BBR (IR) Upper:
- BBR (red) Upper:

- ARIES:
- DEIMOS:
- IR Camera:
- JNO2 Lower:
- JNO2 Upper:
- JO1D Lower:
- JO1D Upper:
- MARSS:
- SHIMS Lower:
- SHIMS Upper:
- SWS:
- TAFTS:

Cloud Probes
- 2DC:
- 2DP:
- FFSSP:
- PCASP:

- ADA:
- CCN:
- CDP:
- CIP 100:
- CIP 25:
- CPI:
- CVI:
- SID1:
- SID2:

Aerosol
- CPC 3025A:
- Filters 47mm:
- Filters 90mm:
- Neph - Dry:
- Neph - Wet:
- PSAP:

- AMS:
- CPC 3010A:
- INC:
- VACC:

Chemistry
- CO Aerolaser 5002:
- NOx TE42C:
- Ozone TE49C:
- Ozone TE49:
- SO2 TE43C:
- TDLAS (NIR) CH4:
- TDLAS (NIR) CO2:

- FAGE:
- Formaldehyde:
- NOxy:
- ORAC:
- PAN:
- PERCA:
- Peroxide:
- PTRMS:
- TDLAS (1C):
- WAS Bags:
- WAS Bottles:

Misc Non-Core
- CASI/ATM:
- LIDAR:
- LTI:
- SAW Hygrometer:

Report Created 19/01/2007 11:34:57

Last Updated: 12/01/2007 16:07:21

Faults / Incidents Log

Flight No. B256
Date: 12th January 2007

Instruments

1. Cruciform GPS – u/s
2. TWC non operational
3. Can't print from "old" laptops as print driver not compatible with Win '95 USB access.
4. DEIMOS causes noise in cloud physics probes, turned off at low level to allow probes a chance to work
5. CO turned off, unstable

Aircraft

Pre-Flighter's Log

Date: 12/1/07 Flight No: B256 Pre-Flighter: PAPJ

Item	√ or x	Location	Action	Comments
1	✓	Hangar	Collect Dustbin, put on a/c	
		Aircraft Cabin		
2	✓	Core Chemistry	Gases x 3 ON	Co HIS no gases
3	✓	Cabin	All Racks Checked	
4	✓	Fwd CorCon	All reqd CBs made	
5	✓	Aft CorCon	CBs made, PCs ON	
6	✓	HORACE	Optical Disk loaded	
7	✓	HORACE	Recording data	
8	✓	HORACE	DLU Status Checked	
9	✓	HORACE	HORACE Status Checked	
10	✓	Satcom H	Power LED ON	
11	✓	Nevzorov	Checked and OFF	
12	✓	GPS	Checked	
13	✓	INU	Align	
14	✓	Cameras Pictures	Checked x 4 OK	
15	✓	Core Chemistry	Instruments Checked OK	
16		Core Chemistry	CO Flows Checked OK	HIS
17		FWVS	Set up	not on.
18	✓	Video x 2	Records okay, Rewind	
19	✓	Delced Rosemount	Heater Checked / Set	
20	✓	Heimann	Calibration Checked	
21	✓	TWC	ON & Checked	
22	✓	GE	Balance checked	
23	✓	INU	Navigate then back to Align	
24	✓	Hubs x 4	Checked ON	
25	✓	Fwd Console	Miss. Sci Laptop CB made	& CB on Port Fwd SSP
26	✓	CNC	Butanol filled	
27		CGPS	Set up	NO.
28	✓	Miss. Sci Laptop	Checked Onboard	

External Checks overleaf →

Pre-Flighter's Log

Item	√ or x	Location	Action	Comments
		External		
29	✓	Turb Probe	Clean if reqd, Photo taken	
30	✓	JW	Cleaned & Checked	
31	✓	DI Rosemount	Cleaned & Checked	
32	✓	NDI Rosemount	Cleaned & Checked	
33	✓	Nevzorov	Cleaned/windings checked	
34	✓	GE	Cleaned & Checked	
35	✓	Lower BBRs	Domes cleaned/checked	
36	✓	Camera Windows	Cleaned	
37	✓	Heimann	Lens checked OK	
38		TWC Cover	Fitted if required	
39	✓	All other covers	Removed	
40	✓	Dustbin	Returned to hangar	
41	✓	Tools	Check ALL in Toolkit	
42	✓	Tools	Avalon informed	
	✓	**Avalon Checks**		Signed
43	✓	Upper BBRs Checked & Cleaned		
44	✓	ICEX applied		
45	✓	Traps empty (weekly only)		

MISSING LOG SHEETS:

The following log sheets are not available for flight B256:

Log	Reason
Cloud Physics Processing	Awaiting completion of processing
Core Chemistry	pre flight only, unmanned operation on auto calibrate so no In Flight log

Document control

Revision	Date	Author	Comments
r0	9 Mar 2007	Doug Anderson	Initial version missing the above noted logs
r1			
r2			

VIDEO RECORDINGS:

3 x Upward Facing Cameras
3 x Downward Facing Cameras

Digital8 video recordings from this flight reside with :

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